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Owsley et al.

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(54) **DEVICE FOR THE ACQUISITION OF
CONTOURED HUMAN BODY SURFACE
VIBRATION SIGNALS**

(75) **Inventors:** Norman L. Owsley, Gales Ferry, CT
(US); Andrew J. Hull, Newport, RI
(US)

(73) **Assignee:** The United States of America as
represented by the Secretary of the
Navy, Washington, DC (US)

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(56) **References Cited**

U.S. PATENT DOCUMENTS

3,945,122 A • 3/1976 Durand et al.

33/512

5,143,088 A • 9/1992 Marras et al. 33/512
5,375,610 A • 12/1994 LaCourse et al. 33/512
5,383,457 A • 1/1995 Cohen 600/443
5,687,487 A • 11/1997 Johnson 33/501.02
5,761,005 A • 6/1998 McKay et al. 360/234.6
6,229,297 B1 • 5/2001 Bohn 33/501.02
6,289,599 B1 • 9/2001 Leifeld et al. 33/501.02
6,295,737 B2 • 10/2001 Patton et al. 33/511

* cited by examiner

Primary Examiner—Diego Gutierrez

Assistant Examiner—Yaritza Guadalupe

(74) *Attorney, Agent, or Firm*—Michael J. McGowan;
James M. Kasischke; Michael F. Oglo

(57)

ABSTRACT

In accordance with the present invention, a device for acquiring contoured human body surface vibration signals is provided. The device comprises a first component for sensing the displacements of a skin surface as a function of time at multiple points on the human body, with the first component having a plurality of sensing elements, a second component for measuring time average displacements of the skin surface at nominal locations of the sensing elements in the first component; and a third component for correcting for the effect of positional error from a set of nominal displacement sensor locations.

6 Claims, 3 Drawing Sheets

